

American Geophysical Union Fall Meeting 2009 Special Issue

NASA Goddard Giovanni Support for YOTC

Dana Ostrenga, Greg Leptoukh, Duane E. Waliser
A51F-0178, Poster Hall (Moscone South): Friday,
December 18, 8:00 AM - 12:20 PM

Current GIOVANNI analytical and statistical tools have been expanded to support the Year of Tropical Convection (YOTC) Satellite Datasets. YOTC provides a unique and comprehensive multi-sensor satellite and model data set designed to facilitate the study and model improvement of "tropical convection" and its multi-scale organization. The data target period, May 01, 2008–April 30, 2010, is long enough to encompass a number of scientifically challenging cases of tropical convection with significant human impact.

NASA Satellite and Model Data and Services to Support NEESPI and MAIRS

Suhung Shen, Greg Leptoukh, and Irina Gerasimov

GC31A-0687, Poster Hall (Moscone South): Wednesday,
December 16, 8:00 AM - 12:20 PM

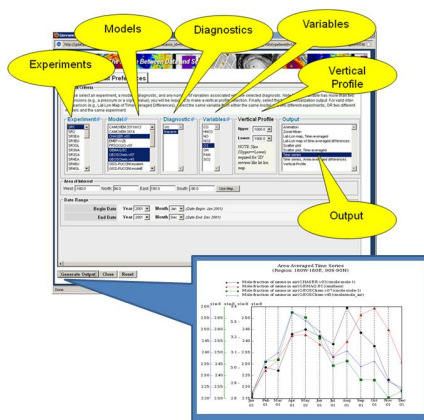
More than thirty monthly and daily global satellite datasets for atmosphere, land surface, and cryosphere were collected and an automated data processing, archive, and distribution system was established in supporting the Northern Eurasia Earth Science Partnership Initiative (NEESPI) project. Most of the data have been integrated into Giovanni. The established data services infrastructure will be used and improved further to support the Monsoon Asia Integrated Regional Study (MAIRS) project. We plan to integrate higher resolution land processes data into the Giovanni system, such as vegetation index, land surface temperature, and active fire from standard MODIS products. About 30 years (since 1979) simulated land products from the NASA Global Land Data Assimilation System (GLDAS), and simulated atmospheric products from the NASA MERRA project will be available through the MAIRS data portal.

NASA Goddard GIOVANNI Support for HTAP

Nicole P. Kurkowski, Greg Leptoukh, Amita V. Mehta, Keith Bryant, Jianfu Pan, Hualan Rui, Daniel da Silva, and Rudolf B. Husar

IN13B-1079, Poster Hall (Moscone South): Monday,
December 14 1:40 PM - 6:00 PM

The Giovanni HTAP (Hemispheric Transport of Air Pollution) Prototype GUI provides the flexibility to display multiple experiments, models, diagnostics, and variables simultaneously. Image choices include: lat-lon maps (time-averaged), lat-lon maps of time-averaged differences, animations, vertical profiles, and time-series, scatter, and zonal mean plots. Users have the ability to choose upper and lower limits of the vertical layer to display, along with the start and end time (for 2001 monthly data). The data is downloaded from the HTAP server, stored locally, and is then pre-processed to convert the different vertical levels for each model to uniform pressure levels.

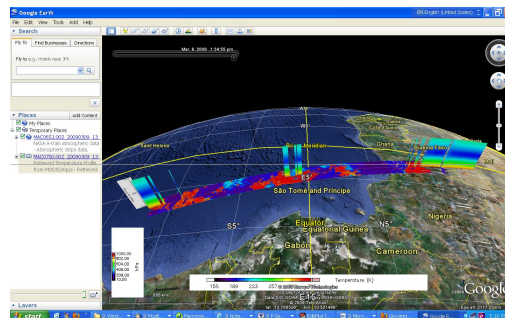


The HTAP Prototype gives the user the ability to specify multiple experiments and models, diagnostics, variables, and visualization types. This example illustrates how a time-series plot can be used to compare global ozone for 4 different models.

Improvement of Visualization of NASA A-Train Data using Google Earth

Aijun Chen, Greg Leptoukh, and Steven J. Kempler
IN43A-1142, Poster Hall (Moscone South): Thursday,
December 17 1:40 PM - 6:00 PM

This presentation describes improvements to the Giovanni system to provide combined KMZ files for visualizing both vertical curtains and surface strips (same temporal and spatial range) obtained from the A-Train Giovanni.



After selecting the temporal/spatial range, KMZ files with vertical information for temperature, water vapor, clouds, aerosols, etc., are packaged together with horizontal layers of cloud pressure, cloud top temperature, cloud cover, rain rate, etc. for downloading and visualizing in Google Earth.

New Capabilities in TRMM Precipitation Data Services at NASA GES DISC

Zhong Liu, Dana Ostrenga, Greg Leptoukh, Steven J. Kempler, and William L. Teng

H31D-0812, Poster Hall (Moscone South): Wednesday, December 16, 8:00 AM - 12:20 PM

The NASA Goddard Earth Sciences Data and Information Services Center (GES DISC) is the home of global precipitation product archives, in particular, Tropical Rainfall Measuring Mission (TRMM) data products.

A number of new capabilities have been added recently:

1) TRMM data products in *Mirador*, a simplified interface for searching, browsing, and ordering Earth science data at the GES DISC; 2) Several new instances have been added in the user friendly TRMM Online Visualization and Analysis System (TOVAS); 3) NetCDF data download for the GIS community; 4) Data via OPeNDAP – provides remote access to individual variables within datasets in a form usable by many tools, such as IDV, McIDAS-V, Panoply, Ferret and GrADS; and 5) The Open Geospatial Consortium (OGC) Web Map Service (WMS). The WMS is an interface that allows the use of data and enables clients to build customized maps with data coming from a different network.

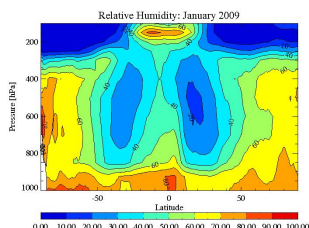
Seven Year Climatologies derived from the Atmospheric Infrared Sounder (AIRS)

Thomas J. Hearty, Andrey K. Savtchenko, Young-In Won, Michael Theobald, Bruce Vollmer, E. Manning, Peter M. Smith, and Dana Ostrenga

A13H-0346, Poster Hall (Moscone South): Monday, December 14, 1:40 PM - 6:00 PM

We examine climatologies derived from 7 years of Temperature, Water Vapor, Cloud, and Trace Gas measurements made by the Atmospheric Infrared Sounder (AIRS). We compare the AIRS climatologies to similar climatologies derived from forecast data and data from MERRA (the Modern Era Retrospective-Analysis for Research and Applications). We also use the AIRS climatologies to examine anomaly trends in the AIRS data record.

Global relative humidity profile, January 2009, from AIRS



Multi-Sensor Data Synergy Advisor

G. G. Leptoukh, Christopher Lynnes, Peter A. Fox, Ana I. Prados, Suhung Shen, S. Zednik, and P. West
IN11B-1054, Poster Hall (Moscone South): Monday, December 14, 8:00 AM - 12:20 PM

Advances in analysis tools and data standards are making it easier to combine remote sensing data from multiple sources. However, as the mechanics become easier, the risk of scientifically naive merging and fusion increases. This presentation will describe the Multi-sensor Data Synergy Advisor (MDSA), which is designed to characterize the differences between two datasets and advise a user (human or machine) on the advisability of combining them, as well as potential sources of bias to account for. The MDSA is driven by an ontology of the sensors, datasets and processing algorithms. The ontology is used to populate a provenance for each dataset, allowing a provenance comparison of the two and highlighting where they differ. Remotely-sensed data sets can be influenced by differences in instrument characteristics, sampling patterns and processing algorithms, which can produce significant systematic differences. These differences can vary with spatial location (e.g., latitude), surface type (e.g. land vs. ocean), or local time of day of the measurements. Also, systematic differences can arise from differences in cloud screening, calibration methods and model assumptions in the processing algorithms.

Prototyping the Multi-Sensor Interdisciplinary Water Cycle Data Portal

Steven J. Kempler, William L. Teng, Greg Leptoukh, Bruce Vollmer, and Zhong Liu
H13F-01, 3011 (Moscone West): Monday, December 14, 1:40 PM - 1:55 PM

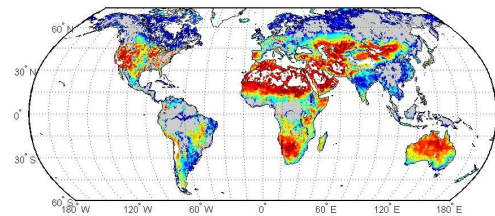
The goal of a future Water Cycle Data Portal (WCDP) is to reduce the time and resources spent by scientists on data management and, thus, facilitate water cycle research, by providing easy access to, and cross-data set manipulation tools for, a community-driven inventory of water cycle products. The goal of the WCDP prototype is to integrate existing data management components relevant to multi-sensor data analysis, to better understand the challenges and science requirements of a full-up WCDP. The WCDP prototype will provide selected, continuous, long-term, multi-sensor NASA and community data records of water cycle components, critical for understanding water cycle variability; and data access and analysis capabilities that will enable comprehensive research studies

The prototype WCDP infrastructure is designed to enable easy addition and integration of new capabilities and data (e.g., those from the upcoming Global Precipitation Mission [GPM] and Soil Moisture Active Passive [SMAP] mission).

Improving World Agricultural Supply and Demand Estimates by Integrating NASA Remote Sensing Soil Moisture Data into USDA World Agricultural Outlook Board Decision Making Environment

William L. Teng, R. A. De Jeu, P. C. Doraiswamy, Steven J. Kempler, and H. D. Shannon
H21A-0800, Poster Hall (Moscone South): Tuesday, December 15, 8:00 AM - 12:20 PM

Because weather has a significant impact on crop progress, conditions, and production, the USDA World Agricultural Outlook Board (WAOB) prepares frequent agricultural weather assessments, in a GIS-based, Global Agricultural Decision Support Environment (GLADSE). The main objective of this project is to improve WAOB's estimates by integrating NASA remote sensing soil moisture observations and research results into GLADSE. Soil moisture is a primary data gap at WAOB. Soil moisture data, generated by the Land Parameter Retrieval Model (LPRM) and customized to WAOB's requirements, will be directly integrated into GLADSE, as well as indirectly by first being integrated into USDA Agricultural Research Service (ARS)'s Environmental Policy Integrated Climate (EPIC) crop model. The LPRM-enhanced EPIC will be validated using three major agricultural regions important to WAOB and then integrated into GLADSE.



AMSR C-band soil moisture, July 2004

Federated Space-Time Query for Earth Science Data Using OpenSearch Conventions

Christopher Lynnes, B. Beaumont, R. E. Duerr, and H. Hua

N33F-04, 102 (Moscone South): Wednesday, December 16, 2:16 PM - 2:28 PM

To address issues of data diversity and identification of useful data for research, the ESIP federation is developing a federated space-time query framework, based on the OpenSearch convention (www.opensearch.org), with Geo and Time extensions. In this framework, data providers publish OpenSearch Description Documents that describe in a machine-readable form how to execute queries against the provider. The novelty of OpenSearch is that the space-time query interface becomes both machine callable and easy enough to integrate into the web browser's search box. This flexibility, together with a simple REST (HTTP-get) interface, should allow a variety of data providers to participate in the federated search framework, from large institutional data centers to individual scientists.

The GSFC Earth Science Data and Information Services Center (GES DISC) Approach to Managing MeaSURES Data

Bruce Vollmer, Steven J. Kempler, and H. K. Ramapriyan

N43B-1153, Poster Hall (Moscone South): Thursday, December 17, 1:40 PM - 6:00 PM

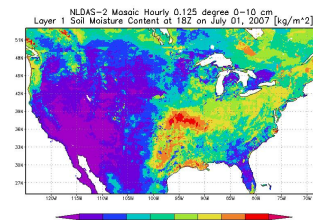
This presentation describes the GES DISC approach to managing the MEaSUREs ESDR datasets assigned to the GES DISC. Based upon a long history of implementing, integrating, and improving Earth science data systems, the GES DISC will utilize this experience to integrate existing and proven reusable data management components to accommodate the new ESDR datasets. These components include a data archive system (S4PA), a data discovery and access system (Mirador), and various web services that facilitate the access and usage of MEaSUREs datasets. In addition, if it is determined to be useful to the user community, a data exploration tool (Giovanni) will be made available for MEaSUREs data sets supported through the GES DISC. The goals of this presentation are to share an approach to ESDR integration, and initiate discussions amongst the data centers, data managers and data providers for the purpose of gaining efficiencies in data management for MEaSUREs projects.

Access, Visualization, Analysis and Usage of Terrestrial Hydrological Data From NASA's Hydrology Data and Information Services Center (HDISC)

Henry Fang, H. K. Beaudoin, D. M. Mocko, M. Rodell, William L. Teng, and Bruce Vollmer

H51F-0816, Poster Hall (Moscone South): Friday, December 18, 8:00 AM - 12:20 PM

The goals of NASA's Hydrology Data and Information Services Center (HDISC) are to provide easy access, visualization and analysis capabilities for hydrological variable data products, thus reducing the time and resources spent by scientists on data management and facilitating hydrological research, and to develop HDISC as a data and services portal that supports weather and climate forecasts, and water and energy cycle research. Current hydrological products hosted at HDISC include outputs from a series of land surface models (LSMs) in the Land Data Assimilation System (LDAS). Users can access the hourly 1/8th degree product for North America (NLDAS) or the 3-hourly 0.25 and 1.0 degree products globally (GLDAS). Planned for future inclusion in HDISC are satellite retrievals of land surface parameters (e.g., temperature, soil moisture, precipitation).



HDISC provides advanced data search and downloading services, as well as simple and intuitive ways to visualize and analyze vast amounts of data.

Left: Soil moisture, July 1, 2007

Other presentations including Giovanni at the 2009 AGU Fall Meeting:

GIScience Operations with Virtual Globes

S. T. Shipley, S. J. Cantrell, and A. Peterlin

N22A-05, 103 (Moscone South): Tuesday, December 15, 11:35 AM - 11:50 AM

Interoperability in an Atmospheric Composition Portal

F. Lindsay, C. Lynnes, G. Leptoukh, S. R. Falke, E. M. Robinson, B. Hildenbrand, O. Goussev, and P. Sommer

IN43E-08, 102 (Moscone South): Thursday, December 17, 3:25 PM - 3:40 PM

North American Land Data Assimilation (NLDAS) Data: 30 Years of Hourly Gridded Precipitation, Surface Meteorology and Fluxes, Soil Moisture, Runoff, and Snow Cover Available at the NASA Goddard GES DISC

D. M. Mocko, B. Cosgrove, Y. Xia, M. B. Ek, K. Mitchell, H. Fang, B. Vollmer, W. L. Teng, G. Lei, E. F. Wood, L. Luo, J. Sheffield, D. P. Lettenmaier, B. Livneh, C. J. Alonge, C. J. Meng, H. Wei, V. Koren, J. C. Schaake, K. C. Mo, and A. Robock

NH41A-1234, Poster Hall (Moscone South): Thursday, December 17, 8:00 AM - 12:20 PM

What some Giovanni users have recently said about Giovanni:

"I am highly impressed by the NASA-Giovanni site, which provides a range of data on different topics for whatever area one requests for. Some windows provide data for inter-comparison, which one can easily download and then use for GIS."

"I really like the model data from the GOCART model for comparison with the satellite data in Giovanni."

"I use the Giovanni system to download aerosol data for my research and believe the NASA Giovanni system is the 'Gold Standard' for access to the vast quantity of geophysical data held by NASA and other similar organizations."

"For multi-dataset, Giovanni is the perfect tool."